

REMARKS

The present application was filed on November 24, 1999 with claims 1-20. Claims 1 through 20 are presently pending in the above-identified patent application. Claims 1, 9 and 20 are proposed to be amended herein. The present amendment is accompanied by a petition fee for extension of time (one month).

In the Office Action, the Examiner rejected claims 1, 2, 4, 9, 10, 12, 18, and 20 under 35 U.S.C. §102(e) as being anticipated by Ruland (United States Patent Number 6,104,831), rejected claims 1-5, 9-13, and 18-20 under 35 U.S.C. §103(a) as being unpatentable over Courtney (United States Patent Number 5,969,755), and further in view of Ruland, rejected claims 6 and 14 under 35 U.S.C. §103(a) as being unpatentable over Ruland and the article entitled "Grouping into Regions, Curves, and Junctions" by Lee et al., rejected claims 7, 8, and 15-17 under 35 U.S.C. §103(a) as being unpatentable over Ruland and Gibbon (E.P. Patent No. 0 635 983 A2), rejected claims 6 and 14 under 35 U.S.C. §103(a) as being unpatentable over Courtney and Ruland, and further in view of Lee et al., and rejected claims 7, 8, and 15-17 under 35 U.S.C. §103(a) as being unpatentable over Courtney and Ruland, and further in view of Gibbon.

The present invention is directed to a method and apparatus for detection of persons or other objects of interest in a video signal or other type of image signal. In accordance with an illustrative embodiment of the invention, a processing system generates, e.g., a threshold difference image by processing an image signal received from a camera. The difference image is then segmented into regions bounded by lines, such as vertical lines, passing through the image, and

silhouette candidates are identified in one or more of the regions. Tensor voting is used to determine saliency values and corresponding tangents for each of the silhouette candidates, and the resulting values and tangents are used to detect the
5 object of interest.

Independent Claims 1, 9, and 20

Independent claims 1, 9, and 20 were rejected under 35 U.S.C. §102(e) as being anticipated by Ruland, and were rejected under 35 U.S.C. §103(a) as being unpatentable over Courtney, and
10 further in view of Ruland.

Regarding claim 1, the Examiner asserts that Ruland discloses segmenting the difference image into a plurality of regions (col. 2, lines 32-33, and FIG. 3). Also regarding claim 1, the Examiner asserts that Courtney discloses segmenting the
15 difference image into a plurality of regions, but acknowledges that Courtney fails to teach that each of the regions are bounded by one or more lines passing through the entire image.

Applicants note that Ruland teaches that "the first image F1 is partitioned into a uniform grid of segments or
20 regions SF1₁-SF1_n (col. 5, lines 19-20)." (Emphasis added.) Independent claims 1, 9, and 20, as amended, require segmenting "the difference image into a plurality of regions utilizing a *grouping principle for preattentive perception*." Support for this amendment can be found on page 11, lines 4-6. Ruland does
25 not disclose or suggest segmenting the difference image into a plurality of regions utilizing a grouping principle for preattentive perception.

Applicants also note that Courtney segments the image into regions of *motion*. Courtney does not disclose or suggest
30 segmenting "the difference image into a plurality of regions

utilizing a grouping principle for preattentive perception."

Thus, Ruland and Courtney, alone or in combination, do not disclose or suggest segmenting the difference image into a plurality of regions utilizing a grouping principle for preattentive perception, as required independent claims 1, 9, and 20, as amended.

Additional Cited References

The Examiner has also cited Lee et al., "Grouping into Regions, Curves, and Junctions" for its disclosure of the determination of saliency values using tensor voting. Lee et al. does not disclose or suggest "segmenting the difference image into a plurality of regions utilizing a grouping principle for preattentive perception, wherein the difference image is segmented into a plurality of regions such that each of the regions are bounded by one or more lines passing through the entire image," as required independent claims 1, 9, and 20, as amended.

The Examiner has also cited Gibbon (E.P. Patent No. 0 635 983 A2) for its disclosure of the step of detecting a neck position of a moving person by analyzing a sum of x-components of tangents along a corresponding silhouette. Gibbon does not disclose or suggest "segmenting the difference image into a plurality of regions utilizing a grouping principle for preattentive perception, wherein the difference image is segmented into a plurality of regions such that each of the regions are bounded by one or more lines passing through the entire image," as required by independent claims 1, 9, and 20, as amended.

Thus, Ruland, Courtney, Lee, and Gibbon, alone or in combination, do not disclose or suggest segmenting the

difference image into a plurality of regions utilizing a grouping principle for preattentive perception, wherein the difference image is segmented into a plurality of regions such that each of the regions are bounded by one or more lines passing through the entire image," as required independent claims 1, 9, and 20, as amended.

Dependent Claims 2-8 and 10-19

Dependent claims 2, 4, 10, 12, and 18 were rejected under 35 U.S.C. §102(e) as being anticipated by Ruland, claims 2-5, 10-13, and 18-19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Courtney, and further in view of Ruland, claims 6 and 14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ruland and Lee et al., claims 7, 8, and 15-17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ruland and Gibbon, claims 6 and 14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Courtney and Ruland, and further in view of Lee et al., and claims 7, 8, and 15-17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Courtney and Ruland, and further in view of Gibbon.

Claims 2-8 and 10-19 are dependent on independent claims 1 and 9, respectively, and are therefore patentably distinguished over Ruland, Courtney, Lee, and Gibbon (alone or in any combination) because of their dependency from amended independent claims 1 and 9 for the reasons set forth above, as well as other elements these claims add in combination to their base claim.

In view of the foregoing, Applicant respectfully submits that the present application is in condition for allowance.

Early and favorable action is earnestly solicited.

Respectfully submitted,

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July 15, 2004

CERTIFICATE OF FACSIMILE TRANSMISSION

It is hereby certified that this correspondence is being transmitted via facsimile to Examiner Chong R. Kim of the U.S. Patent and Trademark Office at 703-872-9306 on the date indicated below.

On July 15, 2004
By Chong R. Kim